

MPYCXL - Multiply Complex Long

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group	S/P	Unit	MAU	opcode	Rte	0	Rx	Ry	CE3	ME																					

Fig. 2A

210

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXL.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXL.[NVZ].[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow (Rx.H1 * Ry.H1 - Rx.H0 * Ry.H0)$ $Rte \leftarrow (Rx.H1 * Ry.H0 + Rx.H0 * Ry.H1)$	F1 F0
[TF].MPYCXL.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on the least significant operand (Rte))

C = No effect

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 2B

220

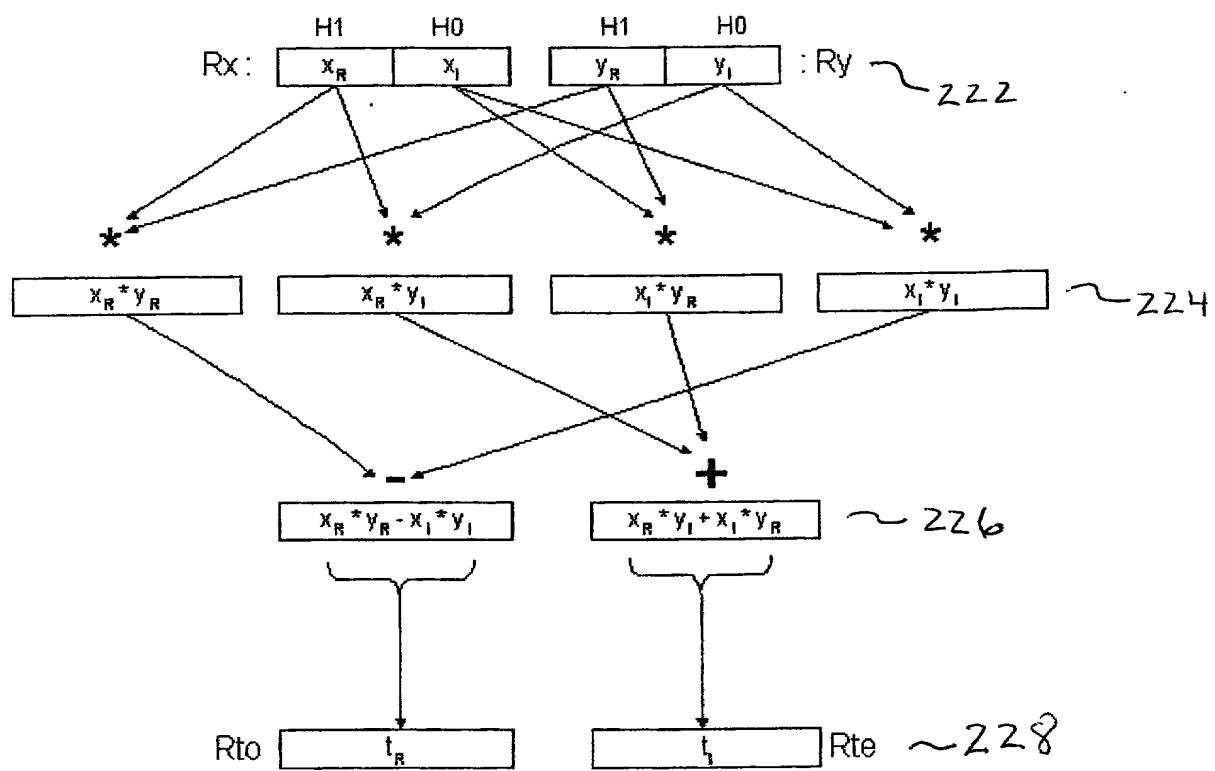


Fig. 2C

← 30

MPYCXJL - Multiply Complex Conjugate Long

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
Group	S/P	Unit	MAUopcode	Rte	0	Rx	Ry	CE3	ME																							

Fig. 3A

← 310

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXJL.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXJL.[NVZ].[SP]M.2SH	Rte, Rx, Ry	Rto \leftarrow (Rx.H1 * Ry.H1 + Rx.H0 * Ry.H0) Rte \leftarrow (Rx.H0 * Ry.H1 - Rx.H1 * Ry.H0)	F1 F0
[TF].MPYCXJL.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on least significant operation (Rte) or as specified)

C Not affected

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 3B

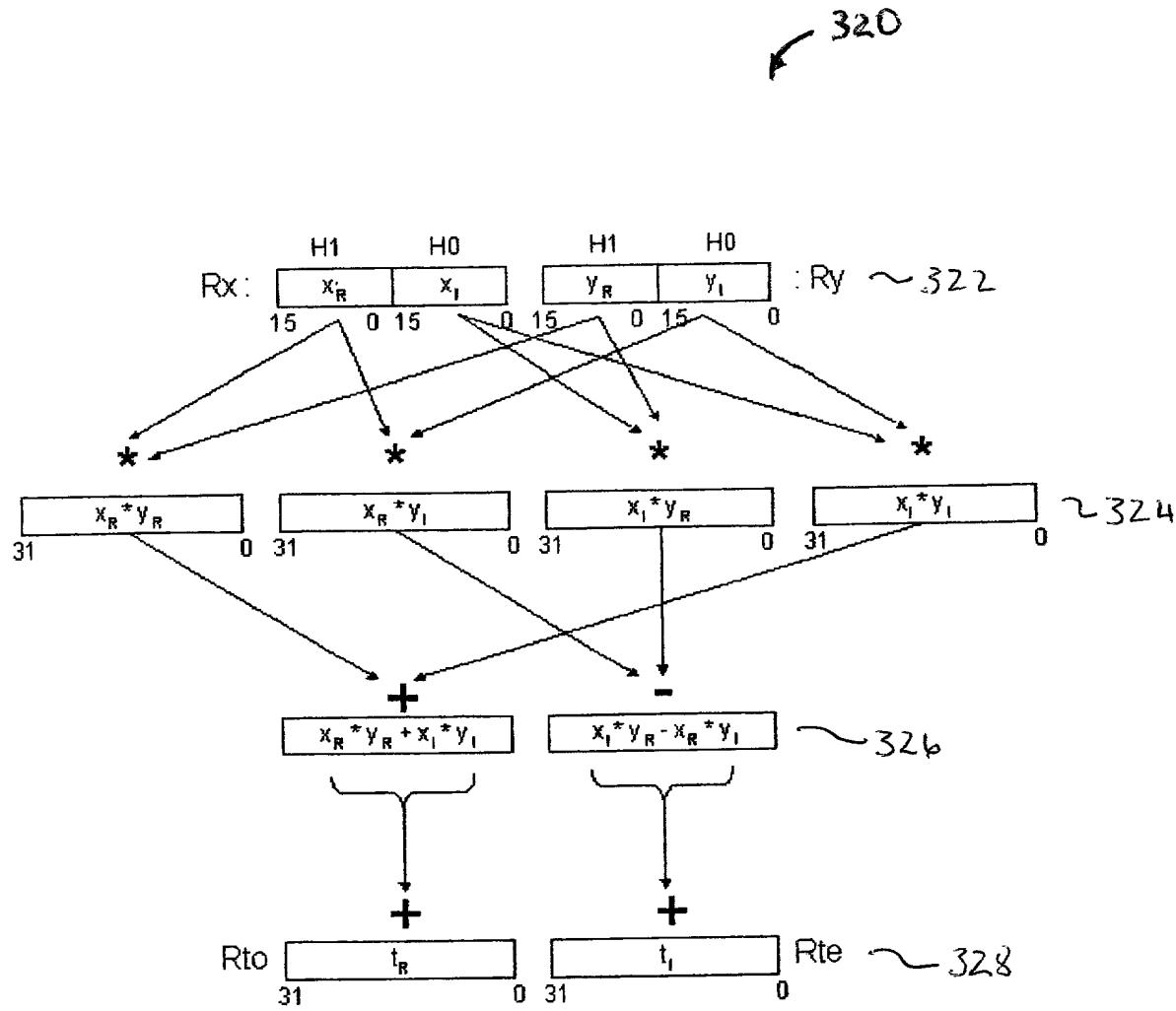


Fig. 3C

400

MPYCXLA - Multiply Complex Long Accumulate

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group	S/P	Unit	MAU	opcode	Rte	0	Rx	Ry	CE3	ME																					

Fig. 4A

410

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXLA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXLA.[NVZ].[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow Rto + (Rx.H1 * Ry.H1 - Rx.H0 * Ry.H0)$ $Rte \leftarrow Rte + (Rx.H1 * Ry.H0 + Rx.H0 * Ry.H1)$	F1 F0
[TF].MPYCXLA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on the least significant operand (Rte))

C Not affected

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 4B

420

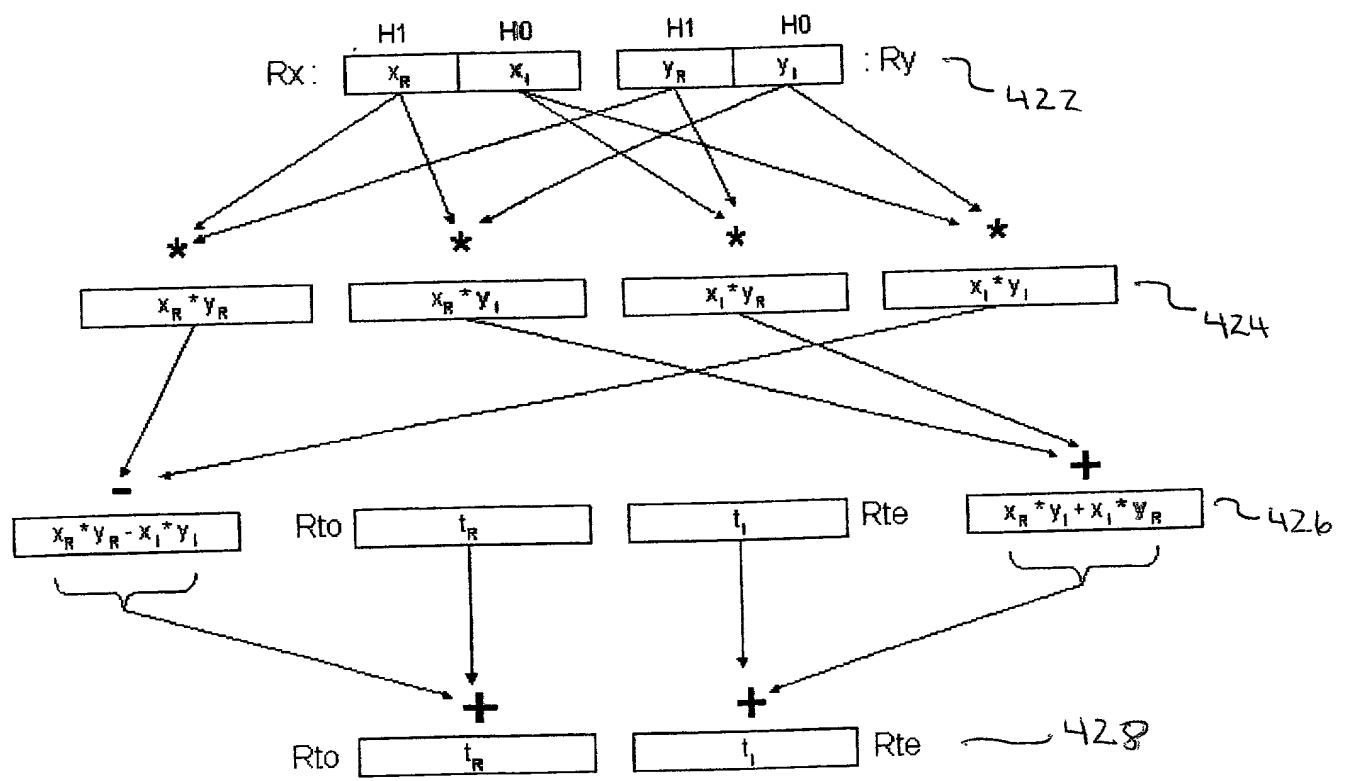


Fig. 4C

4500

MPYCXJLA - Multiply Complex Conjugate Long Accumulate

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group	S/P	Unit	MAUopcode	Rte	0	Rx	Ry	CE3	ME																						

Fig. 5A

510

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXJLA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXJLA. INVZ .[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow Rto + (Rx.H1 * Ry.H1 + Rx.H0 * Ry.H0)$ $Rte \leftarrow Rte + (Rx.H0 * Ry.H1 - Rx.H1 * Ry.H0)$	F1 F0
[TF].MPYCXJLA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on least significant operand (Rte))

C : Not affected

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 5B

520

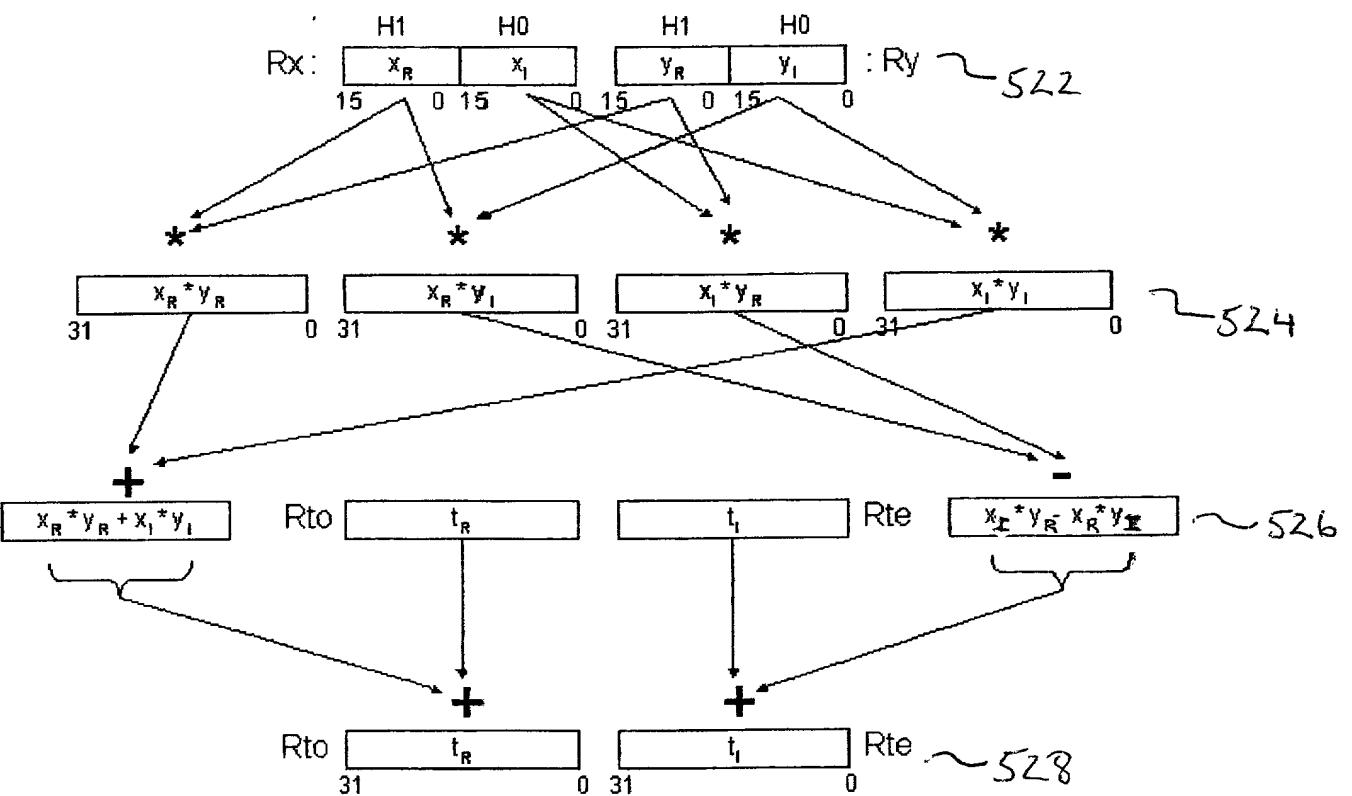


Fig. 5C

MPYCXLXA - Multiply Complex Long Extended Precision Accumulate

60°

Encoding

Group	S/P	Unit	MAU	opcode	Rte	0	Rx	Ry	CE3	ME
31	30	29	28	27	26	25	24	23	22	21
20	19	18	17	16	15	14	13	12	11	10
9	8	7	6	5	4	3	2	1	0	
Group	S/P	Unit	MAU	opcode	Rte	0	Rx	Ry	CE3	ME

- 662

- 6 -

000000000033222222222222211111111111111100000000000000	76543210109876543210987654321098765432109876543210	668
XPR.B1	Rto {1, 5, 9, 13, 17, 21, 25, 29}	

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-612

- 61 -

FIG. 6A

610

Syntax/Operation

Instruction	Operands	Operation	ACF
			Dual Halfwords
MPYCXLXA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXLXA.[NVZ]ISP]M.2SH	Rte, Rx, Ry	XPR.B0 Rto \leftarrow XPR.B0 Rto + (Rx.H1 * Ry.H1 - Rx.H0 * Ry.H0) XPR.B1 Rte \leftarrow XPR.B1 Rte + (Rx.H1 * Ry.H0 + Rx.H0 * Ry.H1)	F1 F0
[TF].MPYCXLXA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on the least significant operand (Rte))

C Not affected

N = MSB of result

$V = 1$ if an integer overflow occurs on either result, 0 otherwise

$Z = 1$ if a zero result is generated, 0 otherwise

Fig. 6B

620

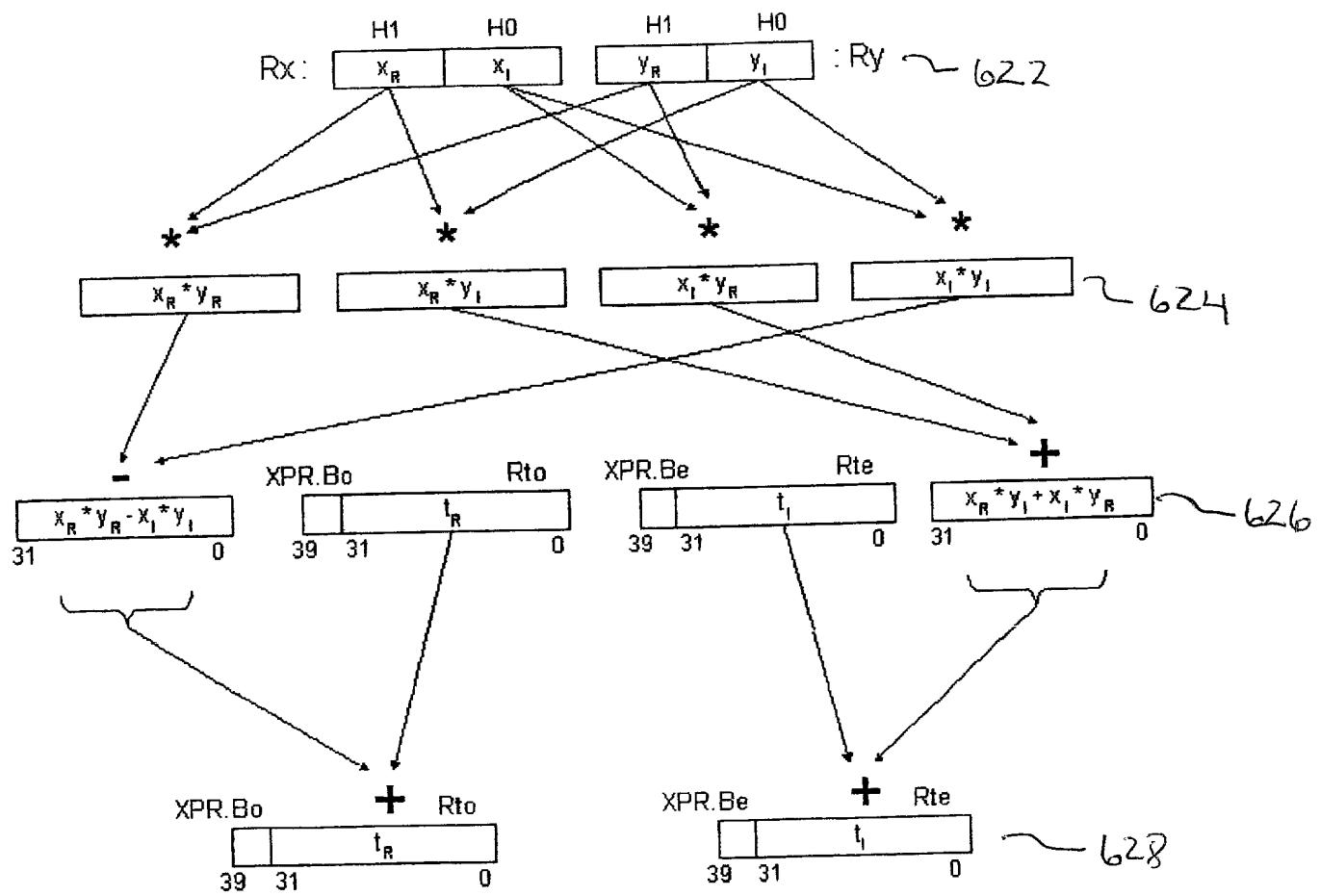


Fig. 6C

MPYCXJLXA - Multiply Complex Conjugate Long Extended Precision Accumulate

760

-70-

00000000003322222222222211111111111111111000000000000	- 704
76543210109876543210987654321098765432109876543210	
XPR.B0	Rle {0, 4, 8, 12, 16, 20, 24, 28}

- 704

- 708

-712

714

FIG. 7A

Syntax/Operation	Operands	Operation	ACF
Instruction	Dual Halfwords		
MPYCXJLXA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXJLXA.[NVZ].[SP]M.2SH	Rte, Rx, Ry	XPR.B0 Rto \leftarrow XPR.B0 Rto + (Rx.H1 * Ry.H1 + Rx.H0 * Ry.H0) XPR.B1 Rte \leftarrow XPR.B1 Rte + (Rx.H0 * Ry.H1 - Rx.H1 * Ry.H0)	F1 F0
[TF].MPYCXJLXA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on least significant operation (Rte))

Arithmetic Scalar Functions

N = MBR of result

$N = \text{MSB of result}$
 $V = 1$ if an integer overflow occurs on either result, 0 otherwise

$Z = 1$ if a zero result is generated, 0 otherwise

Fig. 7B

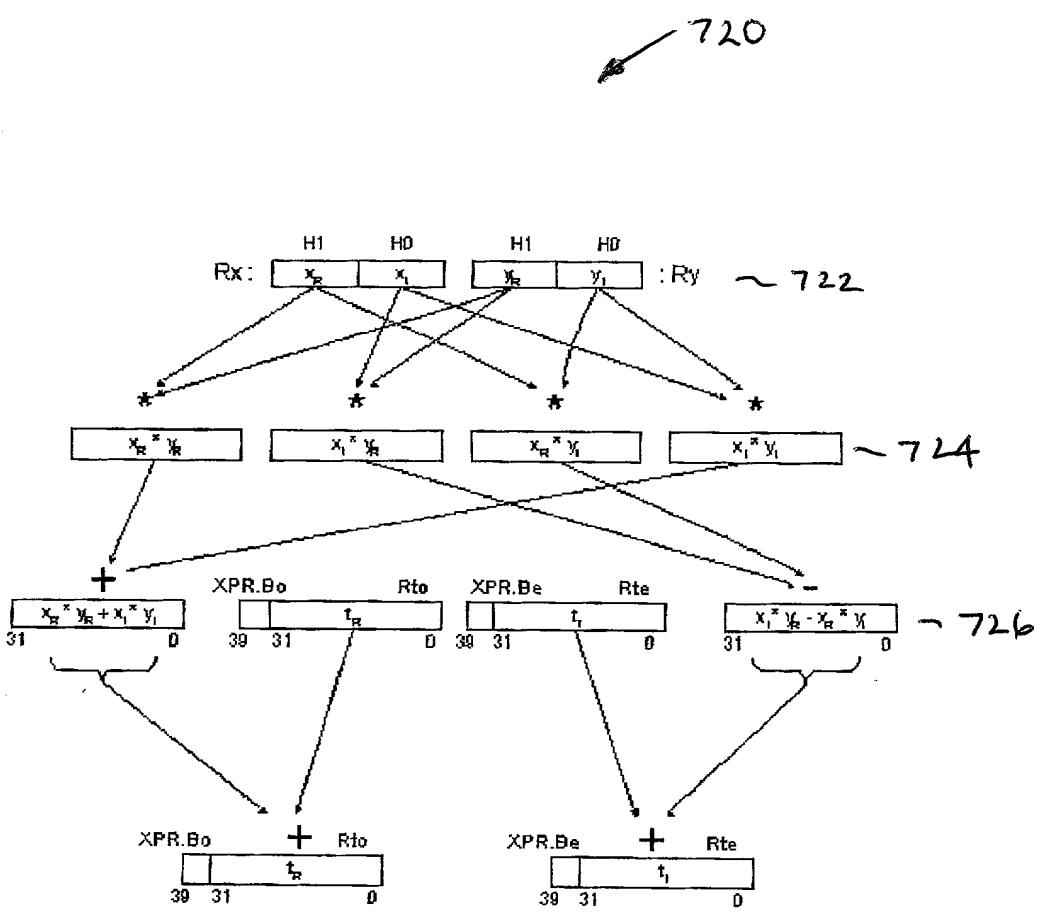
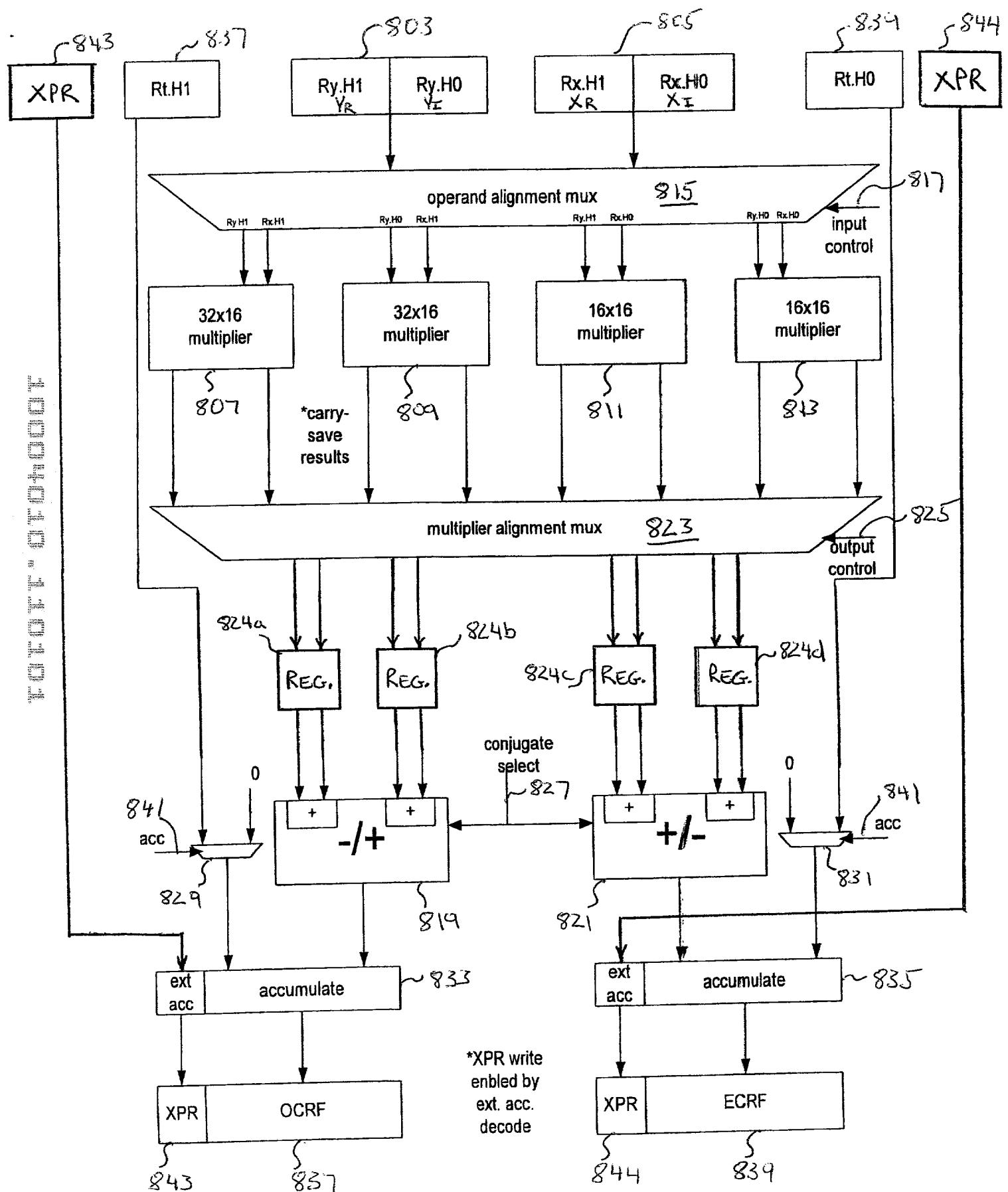


FIG. 7C

Fig. 8

800



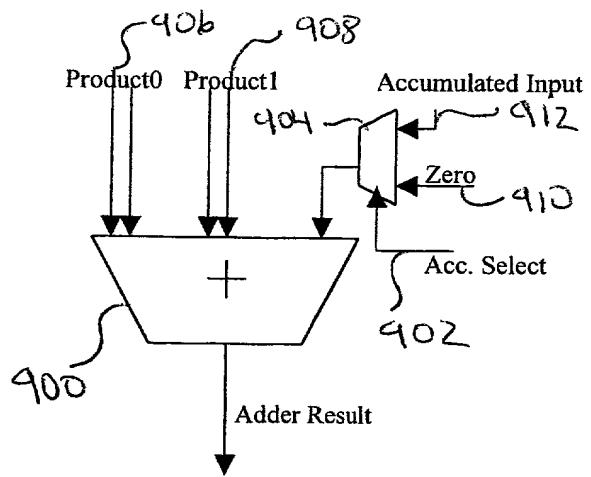
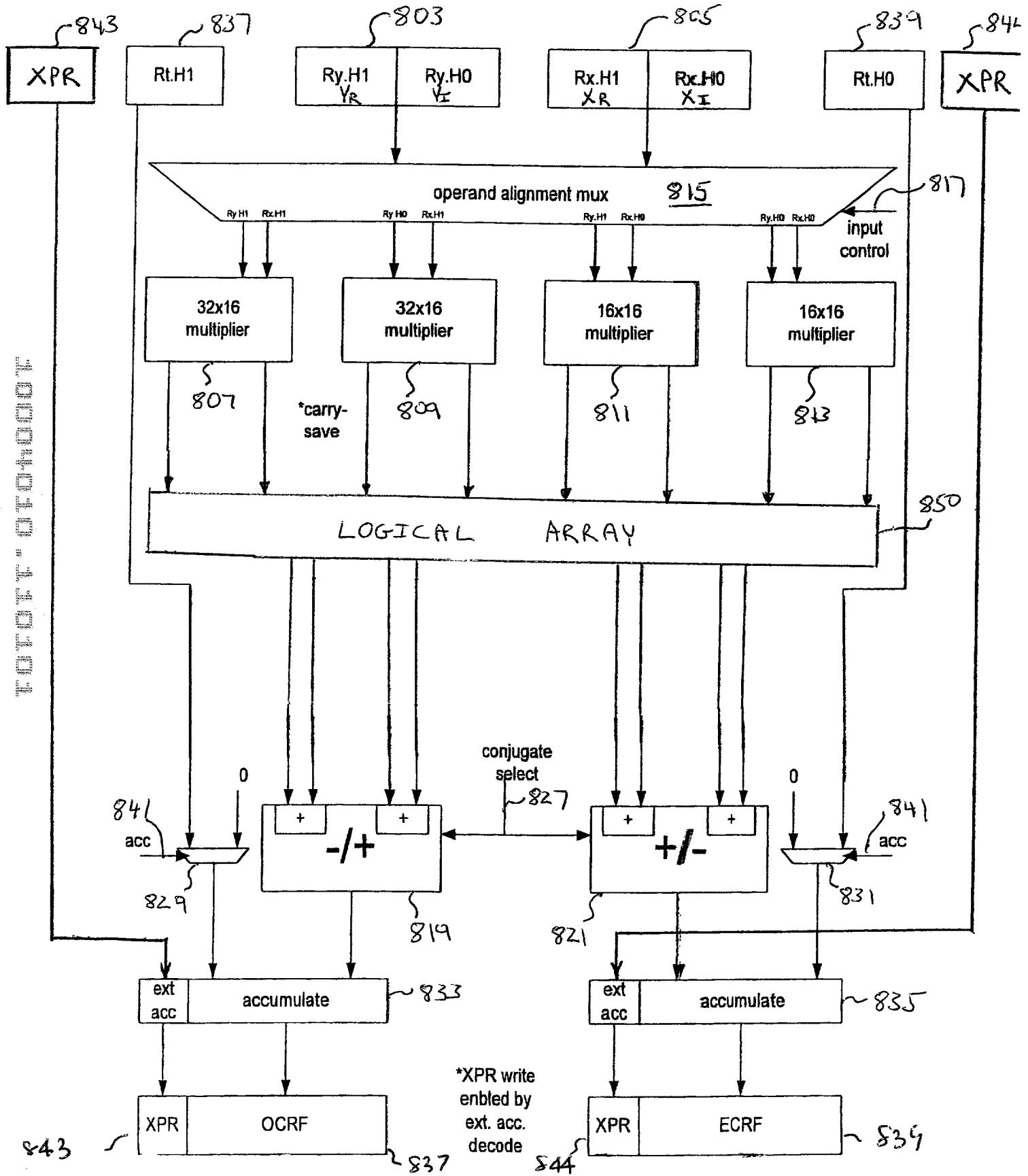


Fig. 9

Fig. 10



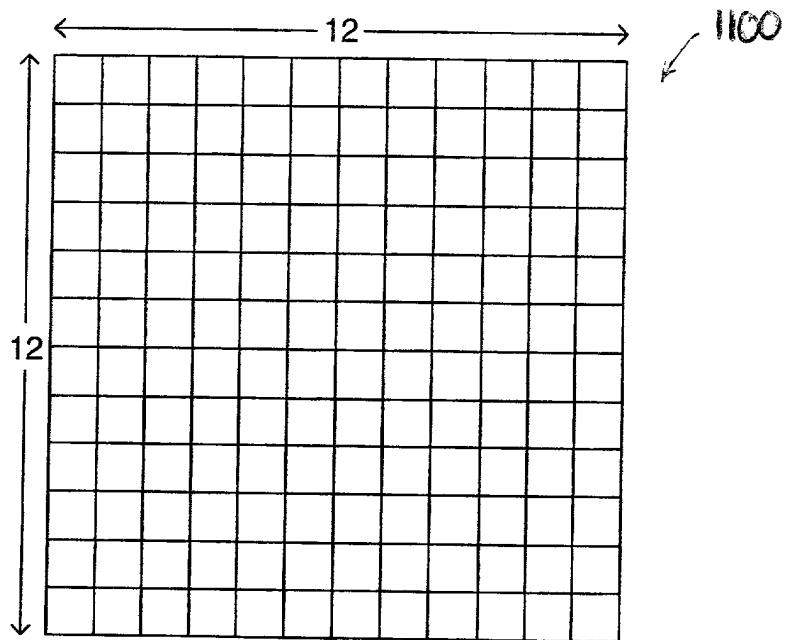


Fig. 11A

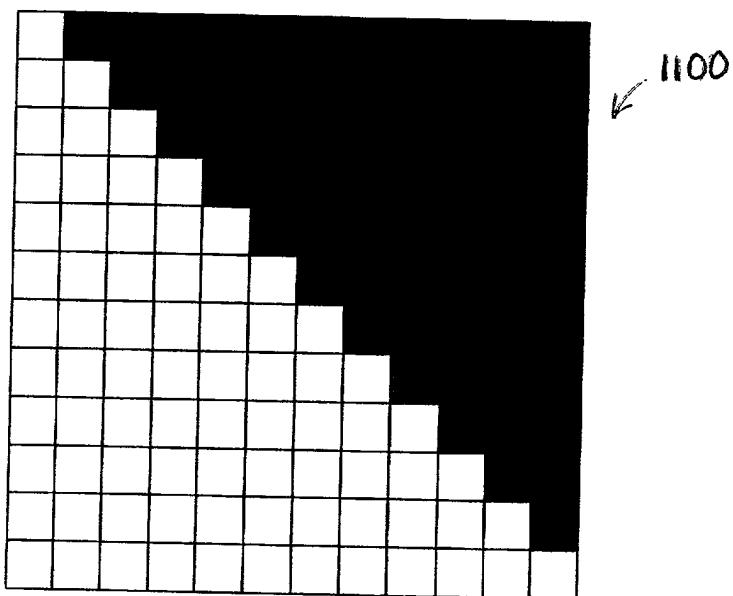
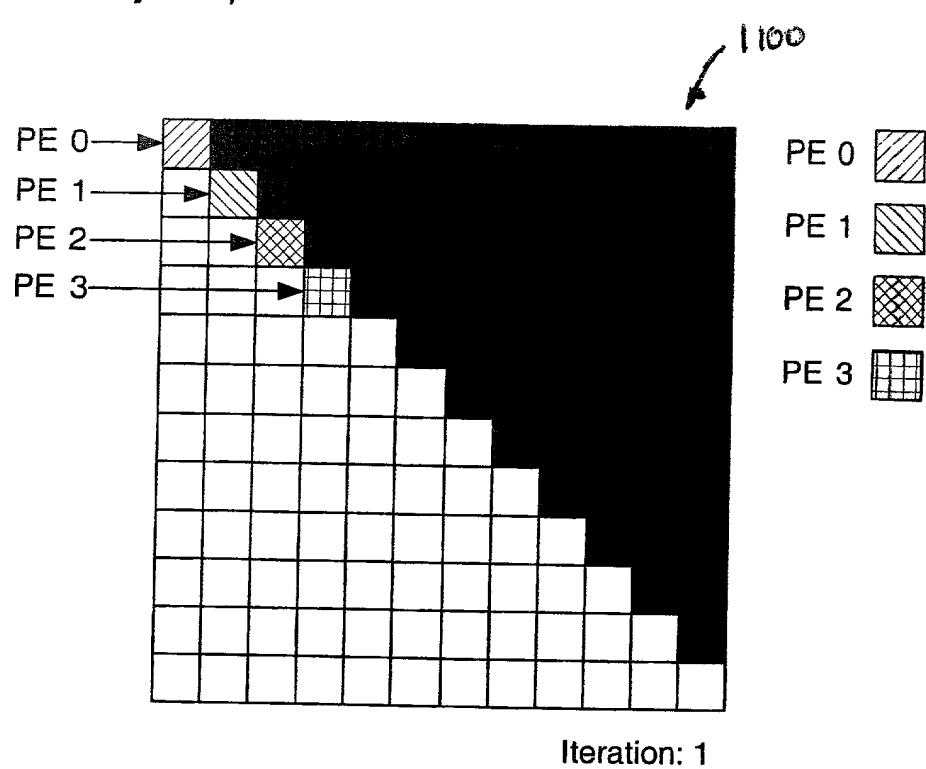
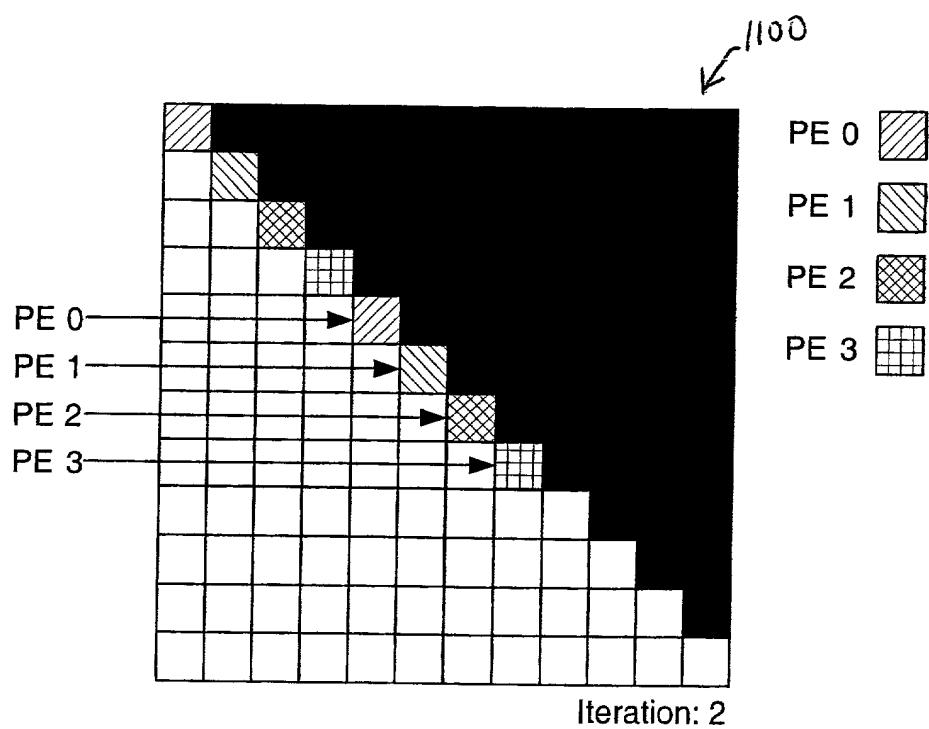


Fig. 11B



Iteration: 1

Fig. 11C



Iteration: 2

Fig. 11D

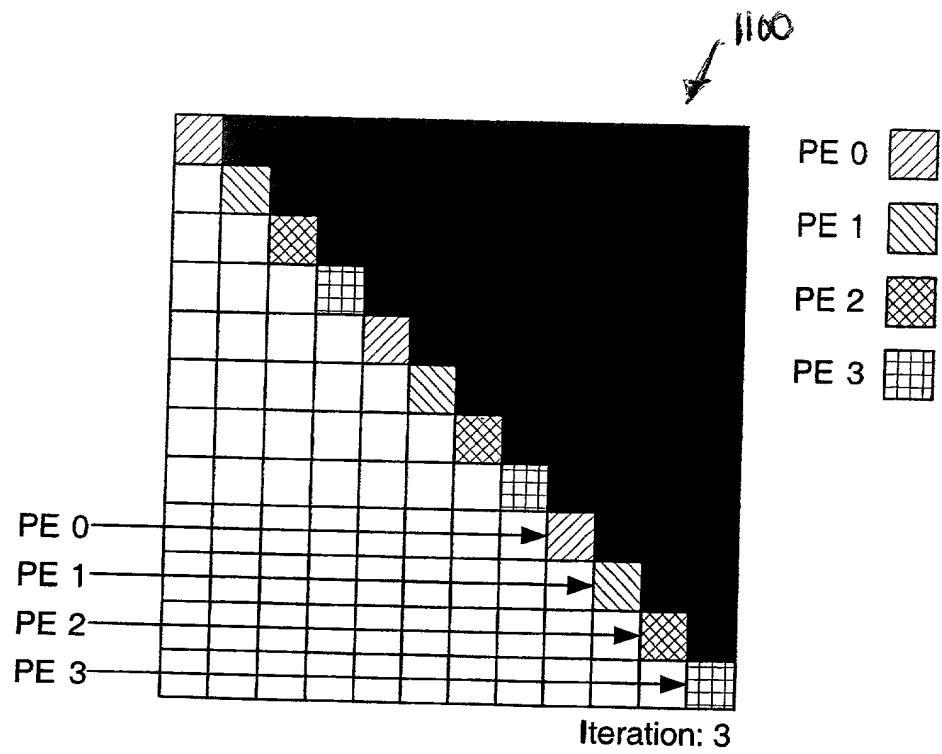


Fig. II E

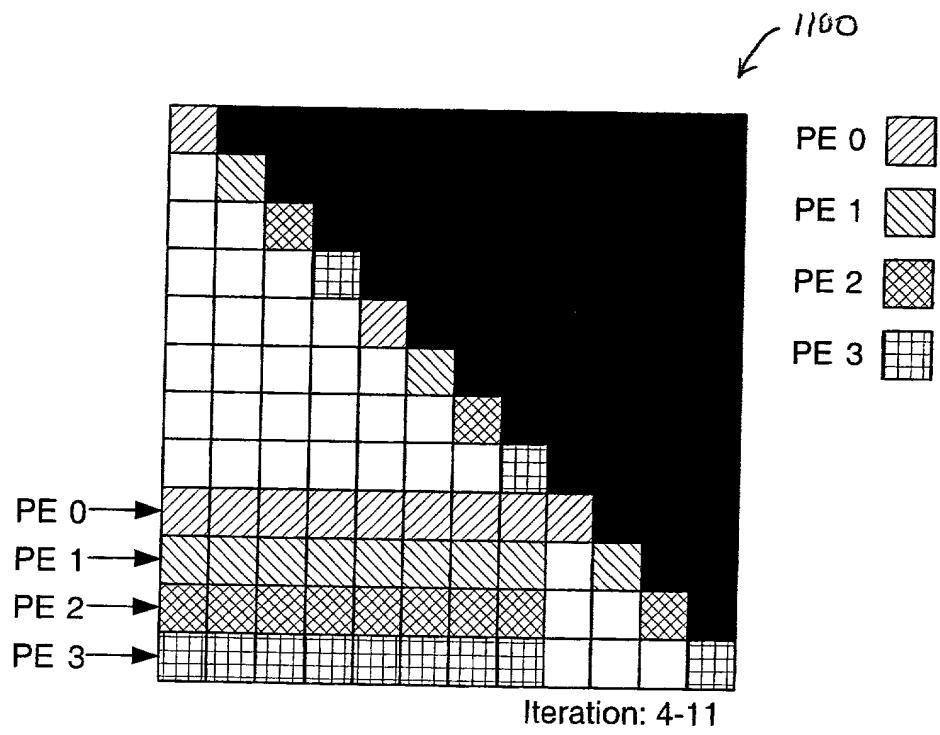


Fig. II F

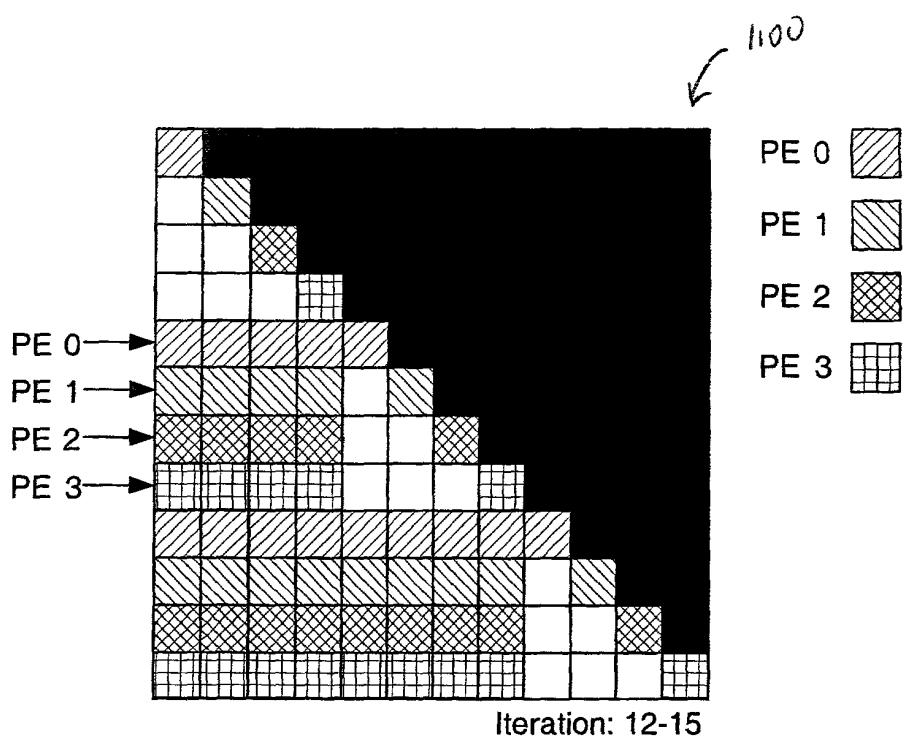


Fig. 11G

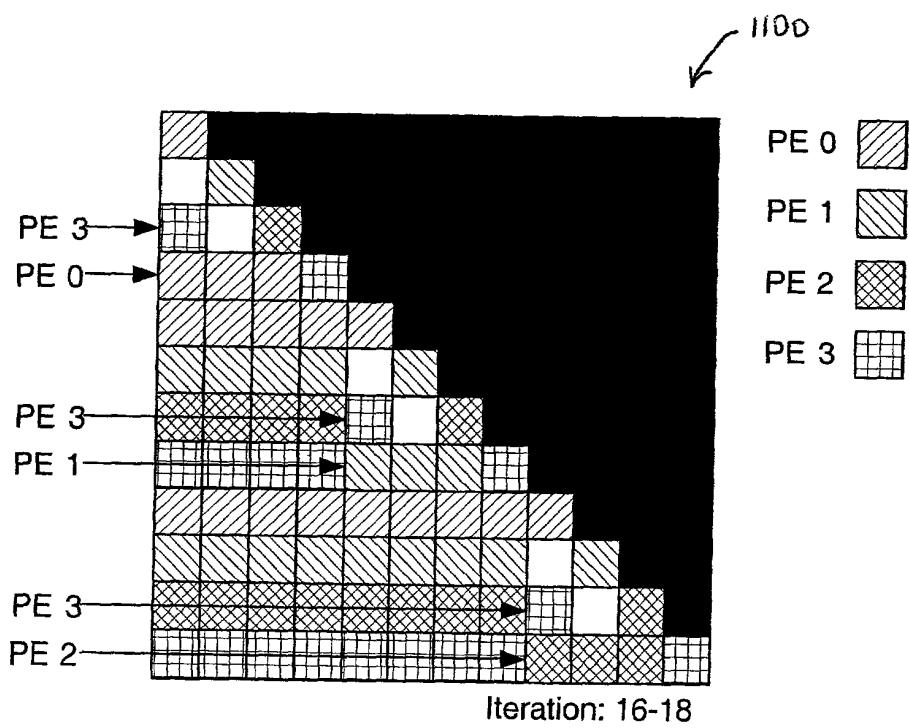


Fig. 11H

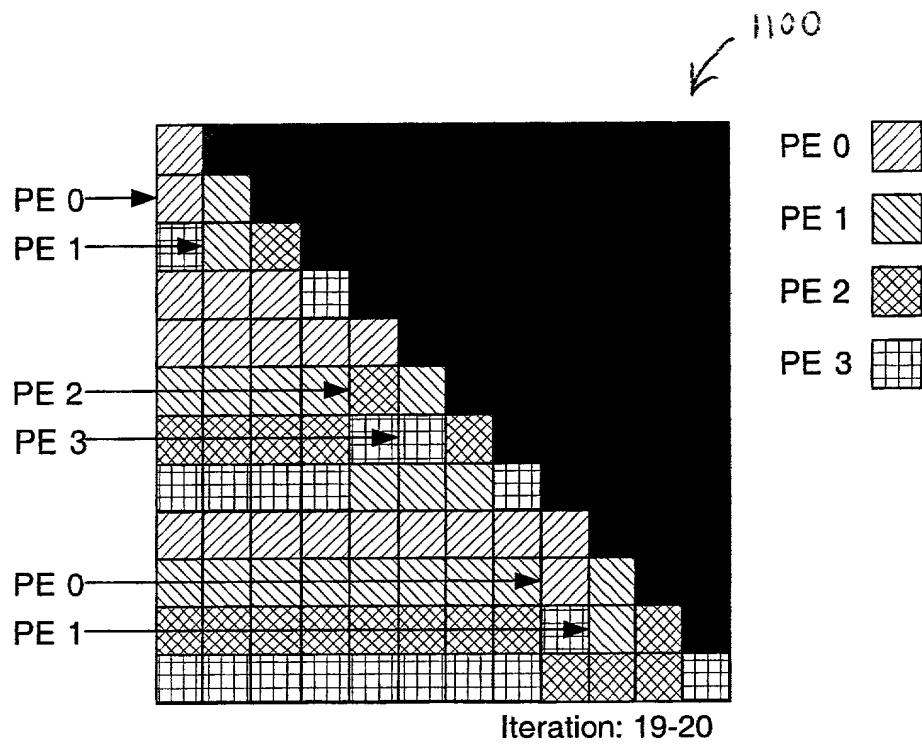


Fig. 11 I